

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A process of reforming a quartz glass crucible, wherein the quartz glass crucible is reformed by an arc discharge generated by electrodes positioned around a rotational axis and configured to heat an inside surface of the crucible while the crucible is rotated, the process comprising:

using an electrode structure having $3n$ electrodes with 3-phase alternating electric current, n being equal to or larger than 2, wherein neighboring electrodes are positioned at regular intervals from each other in a ring-like configuration so as to form a stable ring-like arc between the neighboring electrodes, without generating a continuous arc between electrodes facing each other across a central portion of the ring-like configuration;

heating the inside surface of the crucible while the crucible is rotated, wherein a diameter of the crucible is 28 inches or more, and a radius r of the ring-like configuration around the rotational axis is at least $\frac{1}{4}$ of a radius R of an open portion of the crucible, but not greater than R , for at least a fixed time during arc heating, wherein air is passed on an outer face of the crucible at a time of the arc heating to perform air cooling; and

removing one of a foreign substance located on the inside surface and a bubble located under the inside surface by arc discharge.

2. (Previously Presented) The process of claim 1, wherein the using step comprises:
arranging the electrodes in the electrode structure such that the neighboring electrodes are positioned at regular intervals in the ring-like configuration so as to have an absolute value θ of a phase difference of the alternating electric current in the range of $90^\circ \leq \theta \leq 180^\circ$.

3. (Canceled)

4. (Original) The process of claim 1, wherein a diameter of the crucible is 28 to 40 inches.

5. (Original) The process of claim 1, wherein the quartz glass crucible is used for the pulling up of single crystal silicon.

6. (Original) The process of claim 2, wherein a diameter of the crucible is 28 to 40 inches.

7. (Original) The process of claim 2, wherein the quartz glass crucible is used for the pulling up of single crystal silicon.

8-12. (Canceled)

13. (Currently Amended) A process of reforming a quartz glass crucible, comprising:

one of mechanically removing a foreign substance on an inside surface of the crucible and removing a bubble just under the inside surface of the crucible by grinding;

using an electrode structure having $3n$ electrodes with 3-phase alternating electric current, n being equal to or larger than 2, wherein neighboring electrodes are positioned at regular intervals from each other in a ring-like configuration so as to form a ring-like arc between neighboring electrodes, without generating a continuous arc between electrodes facing each other across a central portion of the ring-like configuration, wherein a diameter of the crucible is 28 inches or more, and a radius r of the ring-like configuration around the

rotational axis is at least $\frac{1}{4}$ of a radius R of an open portion of the crucible, but not greater than R, for at least a fixed time during arc heating, wherein air is passed on an outer face of the crucible at a time of the arc heating to perform air cooling; and

fusing the inside surface of the crucible to be smoothed.

14. (Original) The process of claim 13, wherein a diameter of the crucible is 28 to 40 inches.

15. (Previously Presented) The process of claim 13, wherein the quartz glass crucible is used for the pulling up of single crystal silicon.

16-17. (Canceled)

18. (Currently Amended) A process of reforming a quartz glass crucible, wherein the quartz glass crucible is reformed by an arc discharge generated by electrodes positioned around a rotational axis and configured to heat an inside surface of the crucible while the crucible is rotated, the process comprising:

using an electrode structure having $2n$ electrodes with 2-phase alternating electric current, n being equal to or larger than 2, wherein neighboring electrodes are positioned at regular intervals from each other in a ring-like configuration so as to form a stable ring-like arc between the neighboring electrodes, without generating a continuous arc between electrodes facing each other across a central portion of the ring-like configuration;

heating the inside surface of the crucible while the crucible is rotated, wherein a diameter of the crucible is 28 inches or more, and a radius r of the ring-like configuration around the rotational axis is at least $\frac{1}{4}$ of a radius R of an open portion of the crucible, but not

greater than R, for at least a fixed time during arc heating, wherein air is passed on an outer face of the crucible at a time of the arc heating to perform air cooling; and

removing one of a foreign substance located on the inside surface and a bubble located under the inside surface by arc discharge.

19. (Currently Amended) A process of reforming a quartz glass crucible, wherein the quartz glass crucible is reformed by an arc discharge generated by electrodes positioned around a rotational axis and configured to heat an inside surface of the crucible while the crucible is rotated, the process comprising:

using an electrode structure having 8 electrodes with 4-phase alternating electric current, wherein neighboring electrodes are positioned at regular intervals from each other in a ring-like configuration so as to form a stable ring-like arc between the neighboring electrodes, without generating a continuous arc between electrodes facing each other across a central portion of the ring-like configuration

heating the inside surface of the crucible while the crucible is rotated, wherein a diameter of the crucible is 28 inches or more, and a radius r of the ring-like configuration around the rotational axis is at least $\frac{1}{4}$ of a radius R of an open portion of the crucible, but not greater than R, for at least a fixed time during arc heating, wherein air is passed on an outer face of the crucible at a time of the arc heating to perform air cooling; and

removing one of a foreign substance located on the inside surface and a bubble located under the inside surface by arc discharge.

20. (Canceled)

21. (New) The process of claim 1, wherein if the foreign substance is present in a depth of about less than 0.2 mm from the inside surface of the crucible, the foreign substance is removed without carrying out mechanical grinding, and if the foreign substance is present in a depth of about more than 0.2 mm from the inside surface, the inside surface of the crucible is smoothed by arc fusion after carrying out mechanical grinding.

22. (New) The process of claim 18, wherein if the foreign substance is present in a depth of about less than 0.2 mm from the inside surface of the crucible, the foreign substance is removed without carrying out mechanical grinding, and if the foreign substance is present in a depth of about more than 0.2 mm from the inside surface, the inside surface of the crucible is smoothed by arc fusion after carrying out mechanical grinding.

23. (New) The process of claim 19, wherein if the foreign substance is present in a depth of about less than 0.2 mm from the inside surface of the crucible, the foreign substance is removed without carrying out mechanical grinding, and if the foreign substance is present in a depth of about more than 0.2 mm from the inside surface, the inside surface of the crucible is smoothed by arc fusion after carrying out mechanical grinding.